

ARTIFACT SHEET

Enter artifact number below. Artifact number is application number + artifact type code (see list below) + sequential letter (A, B, C ...). The first artifact folder for an artifact type receives the letter A, the second B, etc..

Examples: 59123456PA, 59123456PB, 59123456ZA, 59123456ZB

09121368BA

Indicate quantity of a single type of artifact received but not scanned. Create individual artifact folder/box and artifact number for each Artifact Type.

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CD(s) containing:

computer program listing

Doc Code: Computer

☐

Artifact Type Code: P

pages of specification

and/or sequence listing

and/or table

Doc Code: Artifact

Artifact Type Code: S

content unspecified or combined

Doc Code: Artifact

Artifact Type Code: U

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Stapled Set(s) Color Documents or B/W Photographs

Doc Code: Artifact Artifact Type Code: C

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Microfilm(s)

Doc Code: Artifact Artifact Type Code: F

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Video tape(s)

Doc Code: Artifact Artifact Type Code: V

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Model(s)

Doc Code: Artifact Artifact Type Code: M

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Bound Document(s)

Doc Code: Artifact Artifact Type Code: B

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Confidential Information Disclosure Statement or Other Documents marked Proprietary, Trade Secrets, Subject to Protective Order, Material Submitted under MPEP 724.02, etc.

Doc Code: Artifact Artifact Type Code X

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Other, description: _____

Doc Code: Artifact Artifact Type Code: Z

March 8, 2004



US005538504A

United States Patent [19]

Linden et al.

[11] **Patent Number:** 5,538,504[45] **Date of Patent:** Jul. 23, 1996[54] **INTRA-EXTRAVASCULAR DRUG DELIVERY CATHETER AND METHOD**

5,236,424 8/1993 Imran.

FOREIGN PATENT DOCUMENTS[75] **Inventors:** Bradley C. Linden, Minneapolis; Donald F. Palme, II, Dayton; Peter T. Keith, Fridley; Robert E. Atkinson, New Brighton, all of Minn.

WO92/10142 6/1992 WIPO.

Primary Examiner—Corrine M. McDermott
Attorney, Agent, or Firm—Brinks Hofer Gilson & Lione[73] **Assignee:** SciMed Life Systems, Inc., Maple Grove, Minn.[57] **ABSTRACT**[21] **Appl. No.:** 269,936[22] **Filed:** Jul. 1, 1994

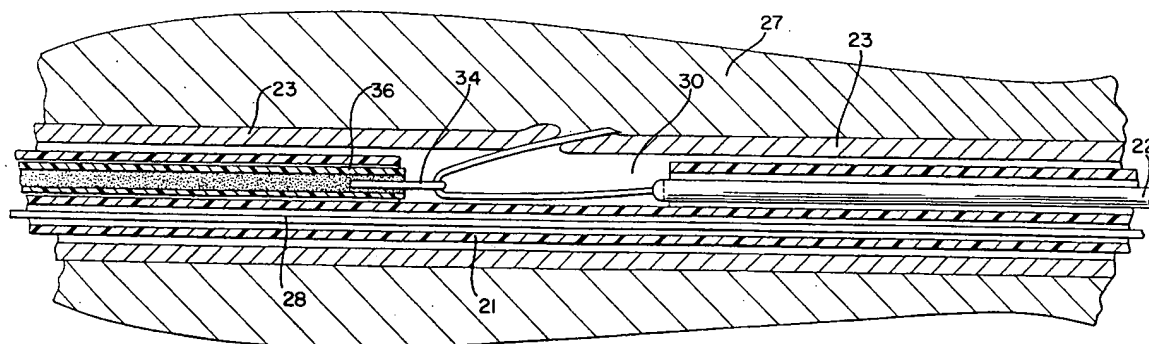
A drug delivery catheter is provided which includes a catheter comprised of an elongated tubular shaft with an inner lumen and a vessel puncturing element which is housed in the lumen. The puncturing element has a retracted position such that it will not be in contact with the vessel wall as the catheter is guided through the vasculature. The puncturing element also has a puncturing position where it protrudes radially outward of the catheter shaft and engages and punctures the vessel wall. The catheter is first inserted into the vessel to be treated and the puncturing element is positioned at the site in the vessel to be treated. The puncturing element is then moved to its puncturing position and the inner surface of the vessel wall is punctured. A drug is then delivered through the puncture. The drug may be delivered into either the vessel wall itself or to the outside of the vessel wall.

Related U.S. Application Data

[63] Continuation of Ser. No. 913,227, Jul. 14, 1992, abandoned.

[51] **Int. Cl.⁶** A61M 31/00[52] **U.S. Cl.** 604/53; 604/164; 604/264[58] **Field of Search** 604/22, 46, 53, 604/96, 280, 164, 264, 272-274; 606/159, 167, 171, 194[56] **References Cited****U.S. PATENT DOCUMENTS**

4,578,061 3/1986 Lemelson.

56 Claims, 5 Drawing Sheets

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*The
United
States
of
America*

The Commissioner of Patents
and Trademarks

*Has received an application for a patent
for a new and useful invention. The title
and description of the invention are en-
closed. The requirements of law have
been complied with, and it has been de-
termined that a patent on the invention
shall be granted under the law.*

Therefore, this

United States Patent

*Grants to the person or persons having
title to this patent the right to exclude
others from making, using or selling the
invention throughout the United States
of America for the term of seventeen
years from the date of this patent, sub-
ject to the payment of maintenance fees
as provided by law.*

Bence Lehman

Commissioner of Patents and Trademarks

Pandra J. Mott
Attest

